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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,993	02/28/2005	Klaus Leitner	H37-119 US	2830

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NOTARO AND MICHALOS
100 DUTCH HILL ROAD
SUITE 110
ORANGEBURG, NY 10962-2100

EXAMINER	
BERMAN, JASON	
ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/525,993	LEITNER ET AL.	
	Examiner	Art Unit	
	Jason M. Berman	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/30/2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 February 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

2. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 6 recites the broad recitation 0.1 to 5 um, and the claim also recites 0.5 to 2.5 um which is the narrower statement of the range/limitation.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3 and 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhang (US 6,071,389).

As to claim 1, Zhang discloses a sputtering cathode comprised of:

- A basic cathode body with cooling arrangement (col 1: lines 34-40: target assembly includes cooling fluid beneath backing plate);
- Cooling contact body disposed between the cooling arrangement and a target such that it is heat conducting (col 1: lines 34-40: target assembly includes cooling fluid beneath backing plate, target attached to backing plate); and
- The contact face between the cooling contact body and the target is provided with a friction-reducing layer (abstract: sputter target assembly of target and backing plate with interlayer between the two).

As to claim 2, Zhang discloses the friction reducing layer is formed of a refractory metal (col 2 lines 39-41: use of tantalum for interlayer).

As to claim 3, Zhang discloses the friction reducing layer is formed of Cr or Ta (col 2 lines 39-41).

As to claims 7 and 8, Zhang discloses that the friction reducing layer is applied to both the cooling contact body and the backside of the target (figure 1: showing interlayer 14 between target 18 and backing plate 16).

3. Claims 1-3 and 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Fukasawa (US 4,966,676).

As to claim 1, Fukasawa discloses a sputtering cathode comprised of:

- A basic cathode body with cooling arrangement (col 3 line 65 - col 4 line 4: cooling of target structure during sputtering to prevent rise in temperature of target);
- Cooling contact body disposed between the cooling arrangement and a target such that it is heat conducting (col 4 lines7-9: cooling backing plate 6 [as shown in figure 2]; col 2 lines 46-49: choice of sheet between target and backing plate to allow cooling); and
- The contact face between the cooling contact body and the target is provided with a friction-reducing layer (figure 2: showing target plates 2 and 3, backing plate 6, and sheet 7 between target and backing plate).

As to claim 2, Fukasawa discloses the friction reducing layer is formed of a refractory metal (col 4 lines 7-11: sheet of Mo between target and backing plate).

As to claim 3, Fukasawa discloses the friction reducing layer is formed of Mo or Ta (col 4 lines 7-11: sheet of Mo between target and backing plate; claim 3: sheet is Mo or Ta).

As to claims 7 and 8, Fukasawa discloses that the friction reducing layer is applied to both the cooling contact body and the backside of the target (figure 1: showing sheet 7 between targets 2 or 3 and backing plate 6).

4. Claims 1, 4 and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by English Translation of Ishikura (JP401096375A)

As to claim 1, Ishikura discloses a sputtering cathode comprised of:

- A basic cathode body with cooling arrangement (Oral translations - page 391 col 1: use of water cooling for backing plate of target structure; page 393 col 1: selection of interlayer to maintain cooling of target with backing plate);
- Cooling contact body disposed between the cooling arrangement and a target such that it is heat conducting (figure 2: showing backing plate 2 [inherently between water cooling and target 8']); and
- The contact face between the cooling contact body and the target is provided with a friction-reducing layer (figure 2: showing interlayer 9 between target 8' and backing plate 2).

As to claim 4, Ishikura discloses the friction-reducing layer is a hard layer of a carbide or nitride of a metal of group 4a (English translation abstract: thin sheet 9 of TiN or TiC).

As to claim 6, Ishikura discloses the friction-reducing layer is 0.1 to 10 um in thickness (English translation abstract).

As to claims 7 and 8, Ishikura discloses that the friction reducing layer is applied to both the cooling contact body and the backside of the target (figure 2: showing interlayer 9 between target 8' and backing plate 2).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikura, as applied to claim 1 above, and further in view of Plath (US 5,077,990) and Hulen (US 2002/0084121).

As to claim 5, Ishikura discloses the connection of a target to a backing plate by use of material which is both an excellent thermal conductor and prevents excessive adhesion between the target and backing plate (English translation abstract). Ishikura

gives examples of suitable materials for the layer between the target and the backing plate, but is silent as to the use of diamond-like carbon (DLC) as the material.

The use of a DLC as the layer would have been obvious to one of ordinary skill in the art at the time of the invention because it has been held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination. MPEP 2144.07. Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945).

Plath discloses coatings of DLC as inherently low friction (col 1 lines 54-57) and Hulen discloses coatings of DLC as inherently heat-conductive. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use DLC as an alternative material in the sputtering apparatus of Ishikura because of the inherently advantageous friction and thermal conductivity of DLC, as discussed in Hulen and Plath.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Berman whose telephone number is (571)270-5265. The examiner can normally be reached on M-R 8am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571)272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/
Supervisory Patent Examiner, Art Unit 1753

/J. M. B./
Examiner, Art Unit 1795